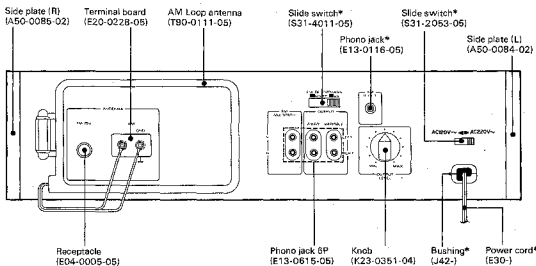
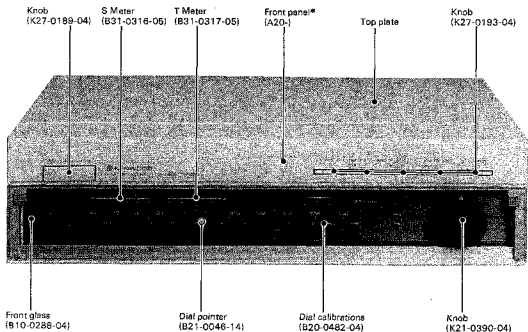




# KT-1000

## AM-FM STEREO TUNER

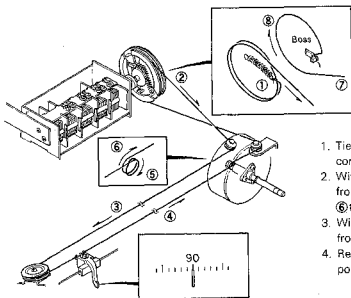


\* Refer to Parts List.

SERVICE MANUAL

# DIAL CORD STRINGING/DISASSEMBLY FOR REPAIR

## DIAL CORD STRINGING

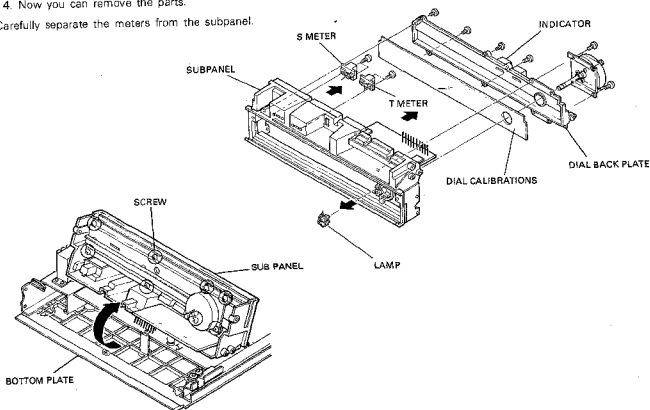


1. Tie the end of the dial cord to the spring. Dress the dial cord in the direction ① through ④.
2. Wind the dial cord 2 turns around the dial shaft starting from its upper side. Dress the dial cord in the direction ⑤ through ⑦.
3. Wind the dial cord 1 turn around the dial pulley starting from its lower side. Fix the dial cord to the boss: (⑧ ⑨).
4. Receive a 90 MHz signal and then mount the dial pointer at the 90 MHz position of the dial calibrations.

## DISASSEMBLY FOR REPAIR

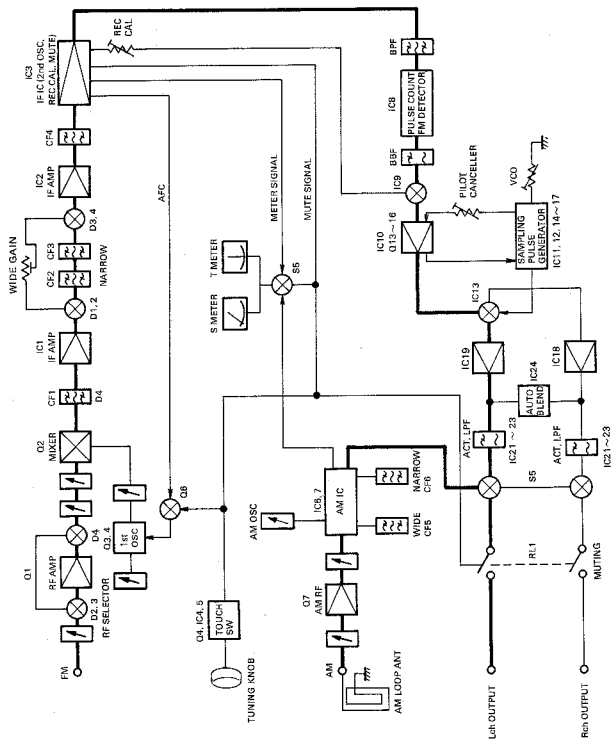
1. Remove the dial cord and the panel.
2. Loosen the screws of the subpanel.
3. Turn the subpanel as illustrated.
4. Now you can remove the parts.

Carefully separate the meters from the subpanel.





# BLOCK DIAGRAM



## CIRCUIT DESCRIPTION

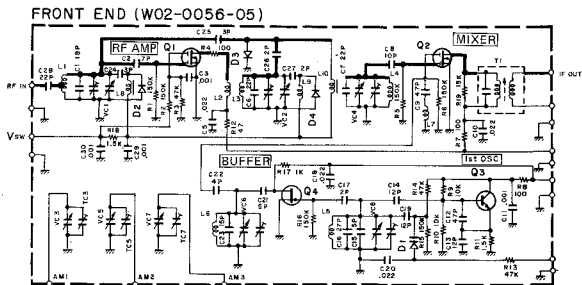
## 1. RF SELECTOR

The KT-1000's front end provides a normal position of high sensitivity at which a single-tuning circuit, RF amplifier, and double-tuning circuit work and a direct position at which a triple-tuning circuit works.

- [1] At NORMAL position, a positive voltage applied to terminal Vsw of the front end turns on Q1 via R2 and turns on D3 via R18 and L10. C24 and C27 of the tuning circuit float from the ground since D2 and D4 are biased reversely, and instead C25 and C26 compensate. (C25

and C26 are grounded with D3 on.) L8 ~ L10 do not comprise a tuning circuit but simply work as choke coils.

- [2] At DIRECT position, a negative voltage applied to terminal Vsw cuts off Q1 and D3 goes off. An input signal coming from antenna enters the first tuning circuit and, via C25 and C26, goes to the second and third and finally comes to the mixer, bypassing the RF amplifier. Because D2 and D4 are on in DIRECT position and C24 and C27 respectively make up the first and second tuning circuits.



## CIRCUIT DESCRIPTION

### 2. SAMPLING PULSE GENERATOR

A sampling pulse generator which makes use of C-MOS devices is described here. For the pilot canceller, MPX, and emphasis selector, refer to KT-917 service manual.

IC14 (2-input OR gates) outputs a sampling pulse or "H" to switch over stereo and monaural modes. At the monaural mode, the output is always "H" since pin 5, an input pin (Q20's collector) of the OR gate, is "H". At the stereo mode, Q20 outputs "L" and the OR gate outputs "H" only when pin 6 of the OR is "H". Thus the output waveform is the same as the sampling pulse.

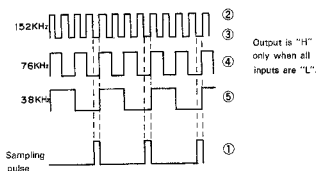


Fig. 2-1

IC15 and IC16 (4-input NOR gates) outputs NOR pulses of 152 kHz, 76 kHz, and 38 kHz. Figure 2-1 is the timing diagram of IC15. An output pulse appears just before the rise of the 38-kHz square wave. The other NOR gate contained in IC15 receives the inverted waveform of the 38-kHz square wave and outputs a pulse waveform which is out of phase by  $\pi/2$ . (See Figure 2-2.) IC16 as well as IC15 receives 38-kHz square waves and inverted 76-kHz square wave and outputs pulses shifted by  $\pi/4$  and  $3/4\pi$ . The outputs of IC16 are used as sampling pulses of the L and R channels. The outputs of IC15 are used as sampling pulses for cancelling SCA beating.

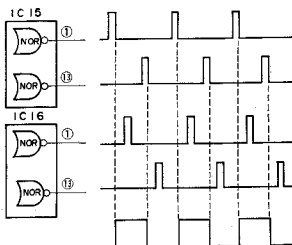


Fig. 2-2 L-channel switching 38-kHz pulse and sampling pulses.

IC17 (D-F-F) divides a 152-kHz pulse coming from IC12 into a 76-kHz pulse. Part of the output is routed to the PLL via a differentiator.

IC12 (VCO) oscillates at 304-kHz and outputs a square wave of 152-kHz which is supplied to IC15 ~ IC17 via buffer Q23.

IC11 (PLL) which makes up a PLL along with IC12 and IC17 generates the pilot cancelling pulse and 38-kHz square wave.

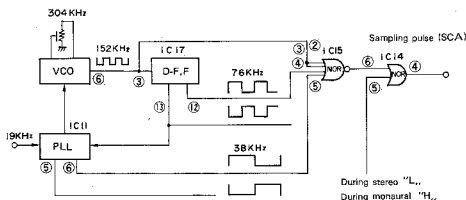


Fig. 2-3



## ADJUSTMENT

Set the MODE switch to AUTO/MUTING, IF BAND switch WIDE and RF SELECTOR switch NORMAL, REC CAL switch OFF, unless otherwise specified.

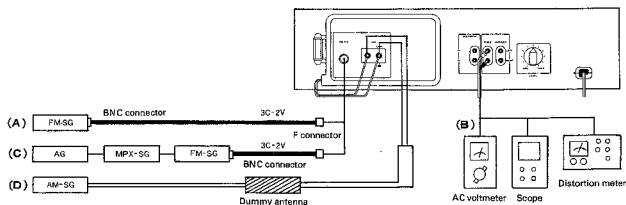
| NO.  | ITEM                | SYSTEM CONNECTIONS  | TEST EQUIPMENT SETTING  | TUNER (RECEIVER) SETTING                   | ALIGNMENT POINTS  | ALIGN FOR   | FIG. NO.    |
|--|---------------------|---|---|--|-------------------|---|-------------|
| <b>FM SECTION</b>                            |                     |   |   |  |                   |   |             |
| 1  | T METER (1)         | (A) *1  | 95 MHz<br>1 kHz, 75 kHz dev   | 95 MHz<br>MODE: MONO<br>IF BAND:<br>NARROW | —                 | *2  |             |
| 2  | T METER (2)         | ditto   | 95 MHz<br>1 kHz, 75 kHz dev<br>60 dB *3                               | 95 MHz<br>MODE: MONO                       | L4                | T meter pointer to be at the center.                        |             |
| 3  | S METER             | ditto   | 95 MHz<br>1 kHz, 40 kHz dev<br>60 dB *3                               | 95 MHz                                     | VR1<br>(X13-2960) | *4  |             |
| 4  | WIDE GAIN           | ditto   | 95 MHz<br>1 kHz, 40 kHz dev   | 95 MHz<br>IF BAND:<br>NARROW<br>MODE: MONO | —                 | *5  |             |
| 5  | WIDE GAIN           | ditto   | *6  | 95 MHz<br>IF BAND: WIDE<br>MODE: MONO      | VR1               | S meter deflection. Same as NARROW.                         |             |
| 6  | REC CAL             | (B)   | —   | REC CAL: ON                                | VR2               | 0.38V   | (18)        |
| 7  | DISTORTION (STEREO) | (C)/(B)   | 95 MHz<br>1 kHz, 68.25 kHz dev *7<br>60 dB *3<br>Selector: L or R     | 95 MHz                                     | T1<br>(Front end) | Minimum distortion  |             |
| 8  | PILOT CANCELLER     | (C)/SCOPE to the connecting point of R151 and R152                        | 95 MHz<br>Pilot signal<br>60 dB *3                                    | ditto                                      | VR11, L17         | Minimum output  | (5)<br>(13) |
| 9  | VCO                 | (C)/Frequency counter to the connecting point of R162 and Q17 via SSVM *8 | 95 MHz<br>0 (dev)<br>60 dB *3   | ditto                                      | VR10              | 76 kHz  |             |
| 10   | SCA (L)             | (C)/(B)   | 95 MHz<br>67 kHz, 7.5 kHz dev<br>Selector: L + R<br>60 dB (ANT input) | 95 MHz                                     | VR8               | Minimum output  |             |
| 11   | SCA (R)             | ditto   | ditto   | ditto                                      | VR9               | Minimum output  |             |
| <b>AM SECTION</b>                            |                     |   |   |  |                   |   |             |
| (1)  | RF ALIGNMENT (AM)   | (D)/(B)   | 600 kHz<br>400 Hz, 30% mod  | AM<br>600 kHz                              | L11, 12, 13       | Maximum amplitude and symmetry of the oscilloscope display. |             |
| (2)  | RF ALIGNMENT (AM)   | (D)/(B)   | 1400 kHz<br>400 Hz, 30% mod   | AM<br>1400 kHz                             | TC3, 5, 7         | Maximum amplitude and symmetry of the oscilloscope display. |             |
| Repeat alignments (1) and (2) several times. |                     |   |   |  |                   |   |             |
| (3)  | S METER             | (D)/(B)   | 1400 kHz<br>60 dB (ANT input)   | 1400 kHz                                   | VR3               | *4  |             |
| (4)  | T METER             | ditto   | ditto   | ditto                                      | VR4               | T meter pointer to be on the center line.                   |             |



## ADJUSTMENT

**Note:** Separation has been adjusted using accurate measuring instruments. Since an ordinary MPX-SG does not have sufficient phase accuracy (especially at 10 kHz), do not use one for separation adjustment. It is not recommended that separation is adjusted in servicing. For reference, separation adjustment procedures are shown in the following.

| NO.                                      | ITEM           | SYSTEM CONNECTIONS | TEST EQUIPMENT SETTING  | TUNER (RECEIVER) SETTING  | ALIGNMENT POINTS  | ALIGN FOR                                 | FIG. NO. |
|--|----------------|--------------------|---|---------------------------|-------------------|---|----------|
| ①  | SUB            | (C)/(B)            | 95 MHz<br>1 kHz, 68.25 kHz<br>Dev *7<br>60 dB *3<br>Selector: L → R   | 95 MHz                    | L16               | Maximum output                            | ④<br>⑤   |
| ②  | SEPARATION (1) | ditto              | 95 MHz<br>1 kHz, 68.25 kHz<br>Dev *7<br>60 dB *3<br>Selector: L       | 95 MHz<br>IF BAND: WIDE   | VR5<br>(L → R)    | Minimum crosstalk from the other channel. |          |
| ③  | SEPARATION (2) | ditto              | 95 MHz<br>1 kHz, 68.25 kHz<br>Dev *7<br>60 dB *3<br>Selector: R       | ditto                     | VR6<br>(R → L)    | ditto                                     |          |
| ④  | SEPARATION (3) | ditto              | 95 MHz<br>10 kHz, 68.25 kHz<br>Dev *7<br>60 dB *3<br>Selector: L or R | ditto                     | L9                | ditto *9                                  |          |
| Repeat alignments "① ~ ④" several times. |                |                    |   |                           |                   |   |          |
| ⑤  | SEPARATION (4) | (C)/(B)            | 95 MHz<br>1 kHz, 68.25 kHz<br>Dev *7<br>60 dB *3<br>Selector: L or R  | 95 MHz<br>IF BAND: NARROW | VR7               | Minimum crosstalk from the other channel. |          |
| ⑥  | AUTO BLEND     | ditto              | 95 MHz<br>1 kHz, 68.25 kHz<br>Dev *7<br>26 dB *3<br>Selector: L or R  | ditto                     | VR2<br>(X13-2980) | Middle crosstalk from the other channel   | ⑫<br>⑬   |

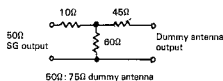


## ADJUSTMENT

### TEST INSTRUMENTS

|                                 |        |
|---------------------------------|--------|
| Oscilloscope .....              | SCOPE  |
| AM signal generator .....       | AM-SG  |
| FM signal generator .....       | FM-SG  |
| Audio frequency generator ..... | AG     |
| AC voltmeter .....              |        |
| FM multiplex generator .....    | FM-MPX |
| Frequency counter .....         |        |
| DC voltmeter .....              |        |
| Distortion meter .....          |        |
| Dummy antenna .....             |        |

- \*1. To perform precise adjustment, a SG (with 75Ω output impedance) must be directly connected to the tuner. Use a connecting cable with a BNC connector at the SG end and an F connector at the tuner end. When an open-scaled SG (which indicates the output level when no load is connected) is used, subtract 6 dB from the SG reading to obtain ANT input level. If the output impedance of the SG is 50Ω, use a new IHF standard 50Ω:75Ω dummy antenna.



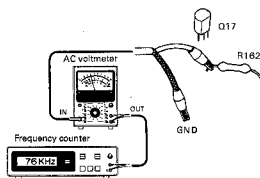
If an open-scaled SG is used, subtract 12 dB from the SG reading to obtain ANT input level. If a load-scaled SG (which indicates the output level when a 50Ω load is connected) is used, subtract 6 dB from the SG reading.

- \*2. Adjust the tuning knob so that the same amount of noise is observed at the top and bottom of the output waveform with a weak signal.



- \*3. Tuner input level.
- \*4. S-meter deflection: 4.8 scale graduations.
- \*5. TUNER input to achieve a S-meter deflection of 3 scale graduations.
- \*6. TUNER input obtained at Step 4.
- \*7. Set deviation to  $\pm 68.25$  kHz with selector in L + R position.  
Set deviation of pilot signal to 6.75 kHz (9%).

\*8



- \*9. If sufficient separation cannot be obtained, turn L9 within  $\pm 5^\circ$  (if they are turned too much, separation at 1 kHz will deteriorate).

# REGLAGES

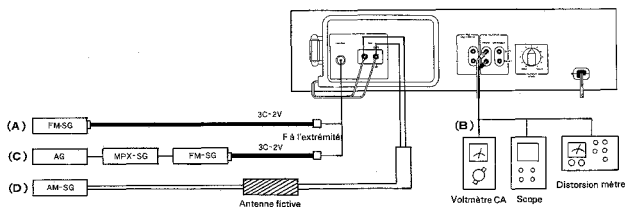
Placer le MODE dans la position AUTO/MUTING, IF BAND sur WIDE, RF SELECTOR sur NORMAL et REC CAL sur OFF sauf indication spéciale.

| N°   | ITEM                                  | RACCORDEMENTS DU SYSTEME   | REGLAGE DE L'APPAREILLAGE  | REGLAGE DU TUNER (AMPLI-TUNER)          | POINTS DE L'ALIGNEMENT | ALIGNER POUR   | FIG. N° |
|--|---------------------------------------|--|--|---|------------------------|--|---------|
| <b>SECTION MF</b>                                  |                                       |  |  |   |                        |  |         |
| 1  | INDICATEUR A ZERO CENTRAL (1)         | (A) *1   | 95 MHz<br>1 kHz (mod)<br>75 kHz (dév)  | 95 MHz<br>MODE: MONO                    | —                      | *2   |         |
| 2  | INDICATEUR A ZERO CENTRAL (2)         | idem   | 95 MHz<br>1 kHz (mod)<br>75 kHz (dév)<br>60 dB (Entrée ANT) *3                             | 95 MHz<br>MODE: MONO                    | L4                     | Aiguille de l'indicateur à zéro central en position centrale.    |         |
| 3  | INDICATEUR DE CHAMP                   | idem   | 95 MHz<br>1 kHz (mod)<br>40 kHz (dév)<br>60 dB (Entrée ANT) *3                             | 95 MHz                                  | VR1<br>(X13-2980)      | *4   |         |
| 4  | GRAND GAIN                            | idem   | 95 MHz<br>1 kHz (mod)<br>40 kHz (dév)  | 95 MHz<br>IF BAND: NARROW<br>MODE: MONO | —                      | *5   |         |
| 5  | GRAND GAIN                            | idem   | *6   | 95 MHz<br>IF BAND: WIDE<br>MODE: MONO   | VR1                    | Déviator du Vu-mètre: La même que pour NARROW.                   |         |
| 6  | REC CAL                               | (B)  | —  | REC CAL: ON                             | VR2                    | 0.38V  | ⑤       |
| 7  | DISTORSION (STEREO)                   | (C)/(B)  | 95 MHz<br>1 kHz (mod)<br>68.25 kHz (dév) *7<br>60 dB (Entrée ANT) *3<br>SELECTION (L ou R) | 95 MHz                                  | T1<br>Tête H.T.)       | Distorsion minimale.   |         |
| 8  | CIRCUIT SUPPRES-SION DE SIGNAL PILOTE | (C)/Relier le SCOPE au point de connexion de R151 et R152.                   | 95 MHz<br>signal pilote<br>60 dB (Entrée ANT) *3   | idem                                    | VR11, L17              | Sortie minimale.   | ⑤<br>⑬  |
| 9  | OSCILLATEUR 76 kHz                    | (C)/Compteur de fréquence au point d'intersection à R182 et Q17 par SSVM. *8 | 95 MHz<br>0 (dév)<br>60 dB (Entrée ANT) *3   | idem                                    | VR10                   | 76 kHz   |         |
| 10   | SCA (L)                               | (C)/(B)  | 95 MHz<br>87 kHz (mod)<br>7.5 kHz (dév)<br>SELECTION (L + R)<br>60 dB (Entrée ANT)         | 95 MHz                                  | VR8                    | Sortie minimale.   |         |
| 11   | SCA (R)                               | ditto  | ditto  | ditto                                   | VR9                    | Minimum output.  |         |
| <b>SECTION MA</b>                                  |                                       |  |  |   |                        |  |         |
| (1)  | RF ALIGNMENT (AM)                     | (D)/(B)  | 600 kHz<br>400 Hz, 30% mod   | AM<br>600 kHz                           | L11, 12, 13            | Maximum amplitude and symmetry of the oscilloscope display.      |         |
| (2)  | ALIGNEMENT H.T. (MA)                  | (D)/(B)  | 1400 kHz<br>400 Hz, 30% mod  | AM<br>1400 kHz                          | TC3, 5, 7              | Amplitude et symétrie maximale de l'affichage de l'oscilloscope. |         |
| Répéter les alignements (1) et (2) plusieurs fois. |                                       |  |  |   |                        |  |         |
| (3)  | INDICATEUR DE CHAMP                   | (D)/(B)  | 1400 kHz<br>60 dB (Entrée ANT)   | 1400 kHz                                | VR3                    | *4   |         |
| (4)  | INDICATEUR A ZERO CENTRAL             | idem   | idem   | idem                                    | VR4                    | Aiguille de l'indicateur à zéro central en position centrale.    |         |

## REGLAGES

**Note:** La séparation a été réglée en utilisant des instruments de mesure de précision. Du fait qu'un MPX-SG ordinaire n'a pas une précision de phase suffisante (généralement à 10 kHz), ne pas utiliser un tel appareil pour le réglage de la séparation. Il n'est pas recommandé d'effectuer le réglage de la séparation lors de l'entretien. Les opérations de réglage de la séparation sont indiquées à la suite en référence.

| N°                                       | ITEM           | RACCORDEMENTS DU SYSTEME | REGLAGE DE L'APPAREILLAGE  | REGLAGE DU TUNER (AMPLI-TUNER) | POINTS DE L'ALIGNEMENT | ALIGNER POUR        | FIG. N° |
|--|----------------|--------------------------|--|--------------------------------|------------------------|---------------------|---------|
| ①  | SUB            | (C)/(B)                  | 95 MHz<br>1 kHz (mod)<br>68,25 kHz (dév) *7<br>60 dB (Entrée ANT) *3<br>SELECTION: (L - R)   | 95 MHz                         | L16                    | Sortie maximale.    | ⑬<br>⑭  |
| ②  | SEPARATION (1) | idem                     | 95 MHz<br>1 kHz (mod)<br>68,25 kHz (dév) *7<br>60 dB (Entrée ANT) *3<br>SELECTION: (L)       | 95 MHz<br>IF BAND: WIDE        | VR5<br>(L → R)         | Diaphonie minimale. |         |
| ③  | SEPARATION (2) | idem                     | 95 MHz<br>1 kHz (mod)<br>68,25 kHz (dév) *7<br>60 dB (Entrée ANT) *3<br>SELECTION: (R)       | idem                           | VR6<br>(R → L)         | idem                |         |
| ④  | SEPARATION (3) | idem                     | 95 MHz<br>10 kHz (mod)<br>68,25 kHz (dév) *7<br>60 dB (Entrée ANT) *3<br>SELECTION: (L ou R) | idem                           | L9                     | idem<br>*9          |         |
| Répéter les points "①~④" plusieurs fois. |                |                          |  |                                |                        |                     |         |
| ⑤  | SEPARATION (4) | (C)/(B)                  | 95 MHz<br>1 kHz (mod)<br>68,25 kHz (dév) *7<br>60 dB (Entrée ANT) *3<br>SELECTION: (L ou R)  | 95 MHz<br>IF BAND: NARROW      | VR7                    | Diaphonie minimale. |         |
| ⑥  | AUTO BLEND     | Idem                     | 95 MHz<br>1 kHz (mod)<br>68,25 kHz (dév) *7<br>26 dB (Entrée ANT) *3<br>SELECTION: (L ou R)  | idem                           | VR2<br>(X13-2960)      | Diaphonie milieu.   | ⑫<br>⑬  |

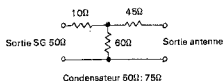


## REGLAGES

### APPAREILLAGE

|                                   |        |
|-----------------------------------|--------|
| Oscilloscope .....                | SCOPE  |
| Générateur MA .....               | AM-SG  |
| Générateur MF .....               | FM-SG  |
| Générateur audio fréquences ..... | AG     |
| Voltmètre CA .....                |        |
| Générateur multiplex stéréo ..... | FM-MPX |
| Fréquencemètre .....              |        |
| Voltmètre CC .....                |        |
| Distorsiomètre .....              |        |
| Antenne fictive .....             |        |

- \*1. Pour réaliser un ajustement précis, SG (avec 75 $\Omega$  d'impédance de sortie) doit être connecté directement au tuner. Utiliser un câble de connexion avec un connecteur BNC à l'extrémité de SG et un connecteur F à l'extrémité du tuner. Quand un SG à échelle ouverte (ce qui indique que le niveau de sortie au moment où il n'y a aucune charge de connectée) est utilisé, soustraire 6 dB de la lecture SG pour obtenir le niveau d'entrée ANT. Si l'impédance de sortie de SG est de 50 $\Omega$ , utiliser une antenne artificielle de 50 $\Omega$ ; 75 $\Omega$  de la nouvelle norme IHF.



Si un SG à échelle ouverte est utilisé, soustraire 12 dB de la lecture SG pour obtenir le niveau d'entrée ANT. Si un SG à échelle chargée (ce qui indique le niveau de sortie au moment où la charge de 50 $\Omega$  est connectée) est utilisé, soustraire 6 dB de la lecture SG.

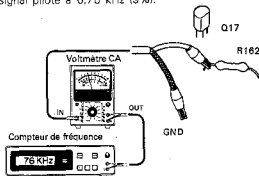
- \*2. Adjuster le bouton d'accord de façon que la même quantité du bruit puisse être observé au sommet et en bas de la forme d'onde de sortie sous des conditions d'alimentation de signal faible.



- \*3. Niveau d'entrée du tuner.  
 \*4. Déviation de l'indicateur de champ: 4,8 graduations de l'échelle.  
 \*5. TUNER entrée pour obtenir une déviation de 3 graduations d'échelle de l'indicateur de champ.  
 \*6. TUNER entrée obtenue dans l'opération 4.

- \*7. Régler la déviation à  $\pm 68,25$  kHz avec le sélecteur en position L+R (gauch + droite). Régler la déviation du signal pilote à 6,75 kHz (9%).

\*8.



- \*9. Si l'on ne peut obtenir une séparation suffisante, tourner L9 dans les limites de  $\pm 5^\circ$ .  
 Si l'on tourne de trop, la séparation à 1 kHz sera dépassée.

# **ABGLEICH**

Außers wenn anders angegeben, MODE-Schalter auf AUTO/MUTING, IF BAND-Schalter auf WIDE, RF SELECTOR-Schalter auf NORMAL und REC CAL auf OFF einstellen.

| NR.  | GEGENSTAND                      | SYSTEM-ANSCHLÜSSE  | PRÜFEINRICHTUNG-EINSTELLUNG   | TUNER (RECEIVER)-EINSTELLUNG            | ABGLEICH-PUNKTE   | ABGLEICHEN FÜR  | ABB. NR. |
|--|---------------------------------|--|---|---|-------------------|---|----------|
| <b>UKW-ABTEILUNG</b>                               |                                 |  |   |   |                   |   |          |
| 1  | KANALMITTEN-ANZEIGER (1)        | (A) *1   | 95 MHz<br>1 kHz, 75 kHz Hub   | 95 MHz<br>MODE: MONO                    | —                 | *2  |          |
| 2  | KANALMITTEN-ANZEIGER (2)        | dito   | 95 MHz<br>1 kHz, 75 kHz Hub<br>60 dB *3                                 | 95 MHz<br>MODE: MONO                    | L4                | Nadel des Kanalmitten-Anzeigers muß auf Mittellinie stehen. |          |
| 3  | FELDSTÄRKE-INSTRUMENT           | dito   | 95 MHz<br>1 kHz, 40 kHz Hub<br>60 dB *3                                 | 95 MHz                                  | VR1<br>(X13-2960) | *4  |          |
| 4  | FELDSTÄRKE-INSTRUMENT (WEIT)    | dito   | 95 MHz<br>1 kHz, 40 kHz Hub   | 95 MHz<br>IF BAND: NARROW<br>MODE: MONO | —                 | *5  |          |
| 5  | FELDSTÄRKE-INSTRUMENT (WEIT)    | dito   | *6  | 95 MHz<br>IF BAND: WIDE<br>MODE: MONO   | VR1               | S-Meter-Ausschlag:<br>Gleich wie bei NARROW.                |          |
| 6  | REC CAL                         | (B)  | —   | REC CAL: ON                             | VR2               | 0,38V   | 16       |
| 7  | KLIRRFAKTOR (STEREO)            | (C)/(B)  | 95 MHz<br>1 kHz, 68,25 kHz<br>Hub *7 60 dB *3<br>SELECTOR: L oder R     | 95 MHz                                  | T1<br>(Frontende) | Minimale Klirr.   |          |
| 8  | PILOT-LÖSCHER                   | (C)/SCOPE zum Anschlusspunkt von R151 und R152.                        | 95 MHz<br>Pilotsignal<br>60 dB *3                                       | dito                                    | VR11, L17         | Minimaler Ausgung.  | 5<br>13  |
| 9  | SPANNUNGS-GEREGELTER OSZILLATOR | (C)/Den Frequenz-zähler über SSVM zum Schnittpunkt von R162 und Q17 *8 | 95 MHz<br>0 (Hub)<br>60 dB (Eingangssignalepegel) *3                    | dito                                    | VR10              | 76 kHz  |          |
| 10   | SCA (L)                         | (C)/(B)  | 95 MHz<br>67 kHz, 7,5 kHz Hub<br>SELECTOR: L + R<br>60 dB (ANT-Eingang) | 95 MHz                                  | VR8               | Minimaler Ausgang.  |          |
| 11   | SCA (R)                         | dito   | dito  | dito                                    | VR9               | Minimaler Ausgang.  |          |
| <b>MW-ABTEILUNG</b>                                |                                 |  |   |   |                   |   |          |
| (1)  | HF-ABGLEICH (MW)                | (D)/(B)  | 800 kHz<br>400 Hz, 30% mod  | AM<br>800 kHz                           | L11, 12, 13       | Maximale Amplitude und Symmetrie des Oszilloskopbildes.     |          |
| (2)  | HF-ABGLEICH (MW)                | (D)/(B)  | 1400 kHz<br>400 Hz, 30% mod   | AM<br>1400 kHz                          | TC3, 5, 7         | Maximale Amplitude und Symmetrie des Oszilloskopbildes.     |          |
| Abstimmungen (1) und (2) mehrers Male wiederholen. |                                 |  |   |   |                   |   |          |
| (3)  | FELDSTÄRKE-INSTRUMENT           | (D)/(B)  | 1400 kHz<br>60 dB (ANT-Eingang)   | 1400 kHz                                | VR3               | *4  |          |
| (4)  | KANALMITTEN-ANZEIGER            | dito   | dito  | dito                                    | VR4               | Nadel des Kanalmitten-Anzeigers muß auf Mittellinie stehen. |          |

## ABGLEICH

**Zur Beachtung:** Die Trennung wurde mit Hilfe von genauen Meßinstrumenten eingestellt. Da ein gewöhnlicher MPX-Meßsender keine ausreichende Phasengenauigkeit (besonders bei 10 kHz) hat, kein derartiges Gerät für die Einstellung der Trennung verwenden. Es ist empfehlenswerter, die Trennung beim Warten einzustellen. Das Vorgehen beim Einstellen der Trennung wird im folgenden beschrieben.

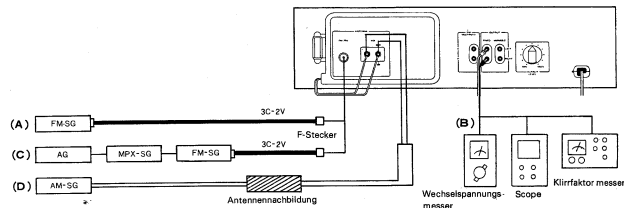
| NR   | GEGENSTAND                | SYSTEM-ANSCHLÜSSE | PRÜFEINRICHTUNG-EINSTELLUNG  | TUNER (RECEIVER)-EINSTELLUNG | ABGLEICH-PUNKTE   | ABGLEICHEN FÜR          | ABB. NR. |
|--|---------------------------|-------------------|--|------------------------------|-------------------|-------------------------|----------|
| ①  | SUB                       | (C)               | 95 MHz<br>1 kHz 68,25 kHz<br>Hub *7 60 dB *3<br>SELECTOR: L - R        | dito                         | L16               | Maximaler Ausgang.      | ⑫        |
| ②  | STEREO KANAL TRENNUNG (1) | dito              | 95 MHz<br>1 kHz (Mod)<br>68,25 kHz (Hub) *7<br>60 dB *3<br>SELECTOR: L | 95 MHz<br>IF BAND: WIDE      | Minimales (L → R) | VR5 Übersprechen.       |          |
| ③  | STEREO KANAL TRENNUNG (2) | dito              | 95 MHz<br>1 kHz (Mod)<br>68,25 kHz (Hub) *7<br>60 dB *3<br>SELECTOR: R | dito                         | VR6 (R → L)       | dito                    |          |
| ④  | STEREO KANAL TRENNUNG (3) | dito              | 95 MHz<br>10 kHz 68,25 kHz<br>Hub *7 60 dB *3<br>SELECTOR: L oder R    | dito                         | L9                | dito *9                 |          |
| Abstimmungen „① bis ④“ mehrere Male wiederholen. |                           |                   |  |                              |                   |                         |          |
| ⑤  | STEREO KANAL TRENNUNG (4) | (C)/(B)           | 95 MHz<br>1 kHz 68,25 kHz<br>Hub *7 60 dB *3<br>SELECTOR: L oder R     | 95 MHz<br>IF BAND: NARROW    | VR7               | Minimales Übersprechen. |          |
| ⑥  | AUTO BLEND                | dito              | 95 MHz<br>1 kHz 68,25 kHz<br>Hub *7 26 dB *3<br>SELECTOR: L oder R     | dito                         | VR2 (X13-2960)    | Mitte Übersprechen      | ⑬        |

### BEMERKUNG

Nach der Einstellung, sich vergewissern, daß UKW Empfang unter 87,5 MHz oder über 108,5 MHz nicht möglich ist. Falls die UKW Station in diesem Bereich empfangen werden kann, wie folgt nachregeln.

1. UKW-Meßsender auf 108 MHz einstellen, 1 KHz (Mod) und 75 KHz (Dev) und an die antennenbuchse anschließen.

2. Den Astimmzeiger des Tuners auf 108 MHz einstellen.
3. TCO so einstellen, daß der Abstimmzähler den Mittelpunkt zeigt.
4. TCR1, TCR2 und TC4 so einstellen, daß der Signalzähler den Höchstwert anzeigt.

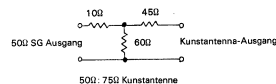


## ABGLEICH

### PRÜFINSTRUMENTE

Oszilloskop..... SCOPE  
MW-Signalgenerator..... AM-SG  
UKW-Signalgenerator..... FM-SG  
NF-Signalgenerator..... AG  
Wechselspannungsmesser  
UKW-Multiplexgenerator..... FM-MPX  
Frequenzzähler  
Gleichspannungsmesser  
Klirrfaktormesser  
Antennennachbildung

1. Für präzise Einstellung muß das SG (75Ω Ausgangs-Impedanz) direkt an den Tuner angeschlossen werden. Dazu ein Kabel mit einem BNC-Stecker am einen Ende und einem F-Stecker am anderen Ende verwenden. Wird ein offenes SG (zur Angabe des Ausgangspegels wenn keine zusätzliche Belastung angeschlossen ist) verwendet, 6 dB von der SG-Angabe subtrahieren um den ANT-Eingangspegel zu erhalten. Ist die Ausgangs-Impedanz von SG 50Ω, das 50Ω:75Ω Kunstanna der neuen IHF-Norm verwenden.



Bei Verwendung eines offenen SG, 12 dB von der SG. Angabe subtrahieren, um den ANT-Eingangspegel zu erhalten. Wird ein belastetes SG (Angabe des Ausgangspegels bei Anschluss von 50Ω) verwendet, 6 dB von der SG Angabe subtrahieren.

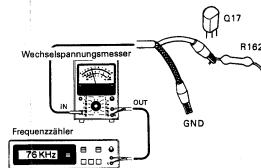
2. Den Abstimmknopf so einstellen, daß an der oberen und unteren Grenze der Ausgangswellenform bei schwachem Signal dasselbe Geräusch auftritt.



3. Tuner-Eingangspegel.
4. Feldstärkeinstrument-Ausschlag: 4,8 Skalenteilen.
5. TUNER Eingang für einen Feldstärkeinstrument-Ausschlag von 3 Skalenteilen.
6. TUNER Eingang bei Schritt 4.

7. Hub mit dem Wahlschalter auf L + R auf 68,25 kHz einstellen. Hub des Kontrollsignals auf 6,75 kHz (9%) einstellen.

\*8.

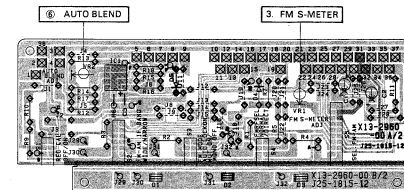
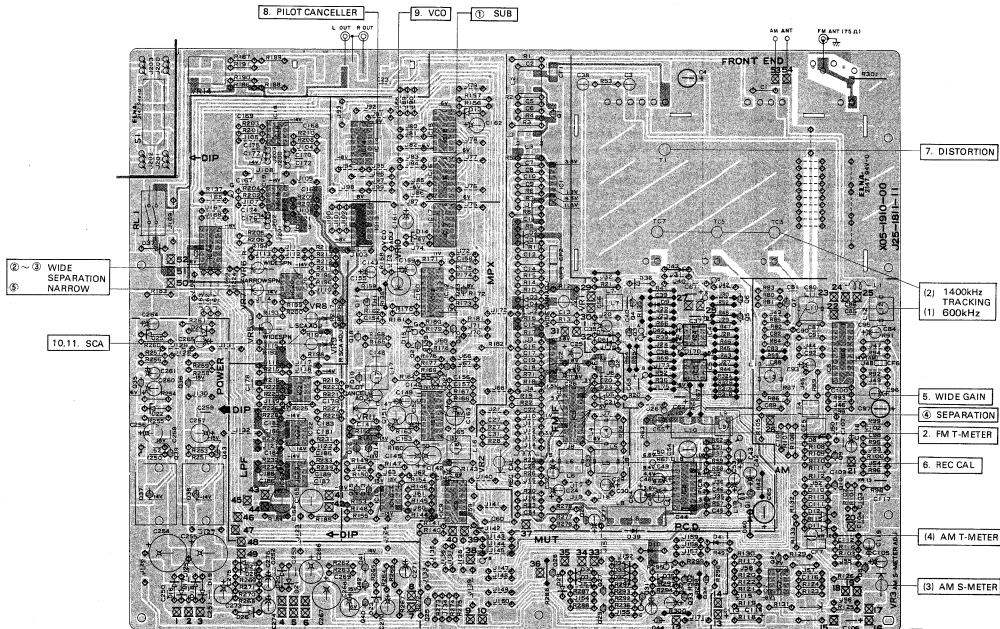


9. Ist die Trennung ungenügend, L9 innerhalb von ±3° drehen (wird über ±5° gedreht, so wird die 1 kHz-Trennung negativ beeinträchtigt).

PC BOARD

TUNER (X05-1910) Component side view  
SWITCH (X13-2960) Component side view

Refer to the schematic diagram for the values of resistors and capacitors.



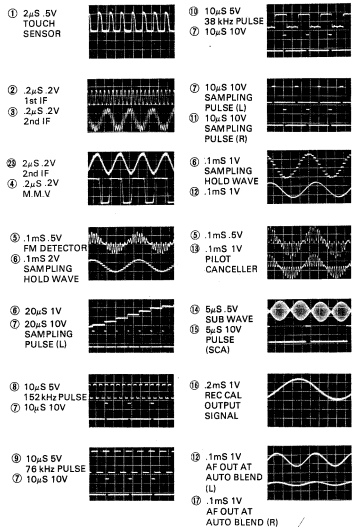
|                         |             |                  |               |            |        |                  |               |         |     |         |
|-------------------------|-------------|------------------|---------------|------------|--------|------------------|---------------|---------|-----|---------|
|                         |             |                  |               |            |        |                  |               |         |     | Signal  |
| Q35,37,39,36,38,43 IC24 | IC8,9,20-23 | IC13,013-16,IC10 | IC9           | 01,IC1,2,3 | IC8    | 07,IC7           | 09,10         | IC6     |     |         |
|                         | IC20        | IC14 07-8,40-42  | IC11,12,15-17 | Q25,20-23  | Q26,26 | Q27,29,2 4,31,44 | IC4,5, Q32-34 | Q5,6,11 | Q24 | Q8      |
|                         |             |                  |               |            |        |                  |               |         |     | Control |

FM SIGNAL LINE  
DC voltage are unsure.



# WAVEFORMS AT CHECK POINTS

- ① ~ ④ : FM 95 MHz 0 (Dev) 60 dB (ANT input)  
 ⑤ ~ ⑧ : FM 95 MHz 1.9 kHz (Mod) 68.25 kHz (Dev) 60 dB (ANT input)  
 ⑨ : FM 95 MHz 1.9 kHz (Mod) 68.25 kHz (Dev) 26 dB (ANT input)



## SUBSTITUTION LIST

| Semiconductor Used | Substitutions      |
|--------------------|--------------------|
| TC4066BP           | μPD40650           |
| MB84002B           | TC4002BP, μPD40020 |
| MB84071B           | TC4071BP, μPD4071C |
| MB84013B           | TC4013BP, μPD4013C |
| μPC4557C           | NJM4558D, AN6552   |
| 2SD302A            | 2SD3045, 2SD1685   |
| 2SA733(A)          | 2SA564A, 2SA1127NG |
| 2SA850             | 2SA777 H           |
| 2SC1735            | 2SC1509 H          |
| 2SB514             | 2SB343             |
| 2SD330             | 2SD234             |
| 2SK105(H, J)       | 2SK68(M, N)        |
| 1S1555             | 1S2076             |
| XZ-060             | WZ-060             |
| XZ-090             | WZ-090             |

## CAUTION:

When using the substitution, make sure the transistor leads are inserted in the correct position.

**KENWOOD®**

**AM-FM STEREO TUNER**

2SA850  
2SC1735



2SA733  
2SC828A



2SB514  
2SD330



2SK125



2SK61



2SK105



μPC4557C



TR4011  
HA11223W



MB84066B  
MB84002B  
MB84013B  
MB84071B  
TC4066BP



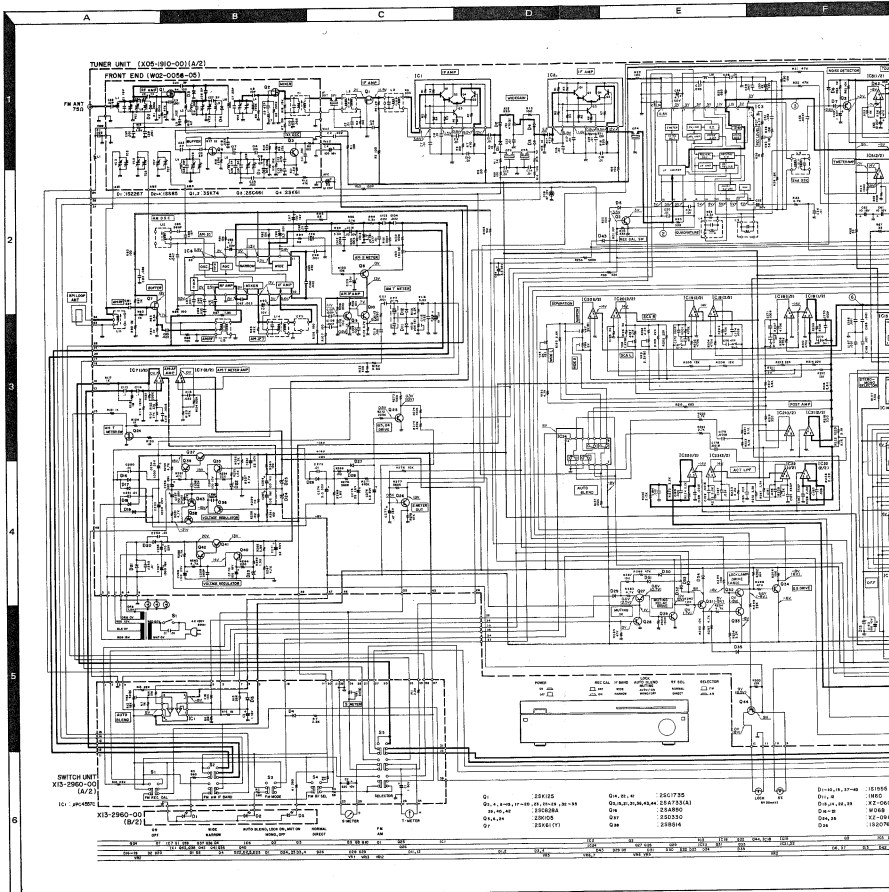
LA1245

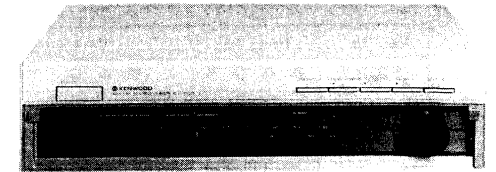
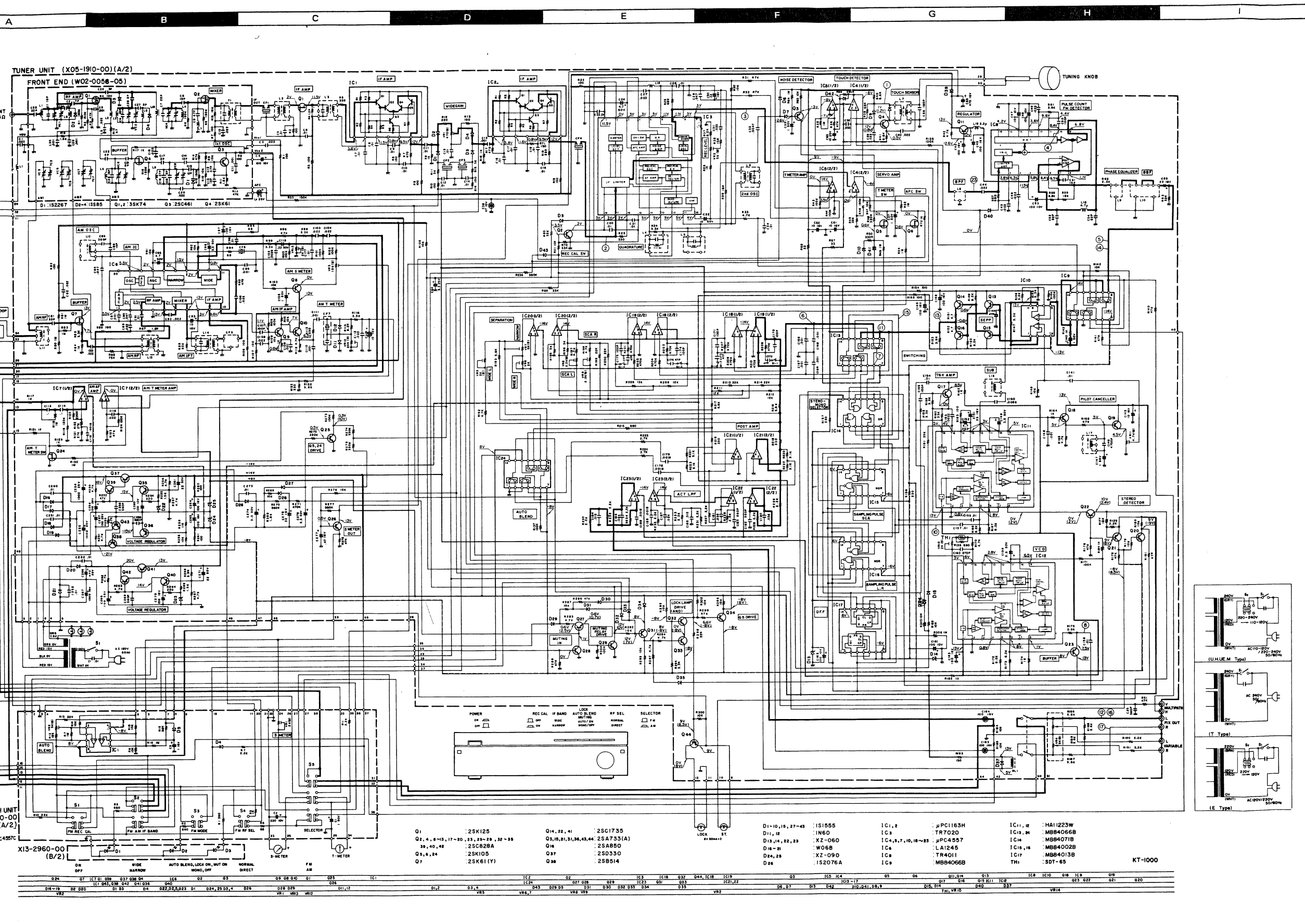


TR7020



μPC1163H





## SPECIFICATIONS

### FM TUNER SECTION

|                                 | NORMAL               | DIRECT               |
|---------------------------------|----------------------|----------------------|
| Usable Sensitivity              | 10.3 dBf<br>(1.8 μV) | 23.3 dBf<br>(8.0 μV) |
| 50 dB Quieting Sensitivity      |                      |                      |
| (Mono)                          | 16.4 dBf<br>(3.6 μV) | 29.3 dBf<br>(16 μV)  |
| (Stereo)                        | 37.3 dBf<br>(40 μV)  | 49.5 dBf<br>(166 μV) |
| Signal to Noise Ratio           |                      |                      |
| (Mono)                          | 90 dB                |                      |
| (Stereo)                        | 85 dB                |                      |
| Total Harmonic Distortion       | WIDE                 | NARROW               |
| Mono                            |                      |                      |
| 100 Hz                          | 0.03%                | 0.04%                |
| 1,000 Hz                        | 0.03%                | 0.15%                |
| 6,000 Hz                        | 0.05%                | 0.3%                 |
| 15,000 Hz                       | 0.04%                | 0.07%                |
| 50 - 10,000 Hz                  | 0.08%                | 0.3%                 |
| Stereo                          |                      |                      |
| 100 Hz                          | 0.04%                | 0.3%                 |
| 1,000 Hz                        | 0.04%                | 0.3%                 |
| 6,000 Hz                        | 0.06%                | 0.3%                 |
| 15,000 Hz                       | 0.4%                 | 1.0%                 |
| 50 - 10,000 Hz                  | 0.12%                | 0.6%                 |
| Capture Ratio                   | 0.8 dB               | 2.0 dB               |
| Alternate Channel Selectivity   | 45 dB                | 65 dB (300 kHz)      |
| Stereo Separation               |                      |                      |
| 1,000 Hz                        | 60 dB                | 50 dB                |
| 50 - 10,000 Hz                  | 47 dB                | 35 dB                |
| 15,000 Hz                       | 40 dB                |                      |
| Frequency Response              | 15 Hz to 15,000 Hz   |                      |
|                                 | ±0.5 dB              |                      |
| Spurious Response Ratio         | 120 dB               |                      |
| Image Response Ratio            | 90 dB                |                      |
| IF Response Ratio               | 110 dB               |                      |
| AM Suppression Ratio            | 70 dB                |                      |
| Sub Carrier Product Ratio       | 73 dB                |                      |
| Antenna Impedance               | 75 ohms unbalanced   |                      |
| FM Frequency Range              | 88 MHz to 108 MHz    |                      |
| Output Level 1,000 Hz 100% Mod. |                      |                      |
| Fixed                           | 0.75V, 2.2 kohms     |                      |
| Variable                        | 0 to 1.5V, 2.2 kohms |                      |

### AM TUNER SECTION

|                              |                                 |
|------------------------------|---------------------------------|
| Usable Sensitivity           | 10 μV                           |
| Signal to Noise Ratio        | 52 dB                           |
| Total Harmonic Distortion    | 0.2%                            |
| Image Rejection              | 70 dB                           |
| Selectivity                  | 30 dB (WIDE),<br>50 dB (NARROW) |
| Output Level 400 Hz 30% Mod. |                                 |
| Fixed                        | 0.25V, 2.2 kohms                |
| Variable                     | 0 to 0.5V, 2.2 kohms            |

### GENERAL

|                    |   |
|--------------------|---|
| Power Requirements | 60 Hz 120V<br>(U.S.A. and Canada Model) or<br>50/60 Hz 110-120/220-240V<br>switchable |
| Power Consumption  | 0.18A   |
| Dimensions         | W 440 mm (17.5/16")<br>H 123 mm (4.27/32")<br>D 388 mm (15.9/32")                     |
| Net weight         | 6.5 kg (14.3 lb)  |

Kenwood follows a policy of continuous advancements in development for this reason specifications may be changed without notice.

Kenwood poursuit une politique de progrès constants en ce qui concerne le développement. Pour cette raison, les spécifications sont sujettes à modifications sans préavis.

Kenwood strebt ständige Verbesserungen in der Entwicklung an. Daher bleiben Änderungen der technischen Daten jederzeit vorbehalten.

DC voltages are measured by a VOM of 25 kΩ/V input impedance.



## PARTS LIST

[illegible]

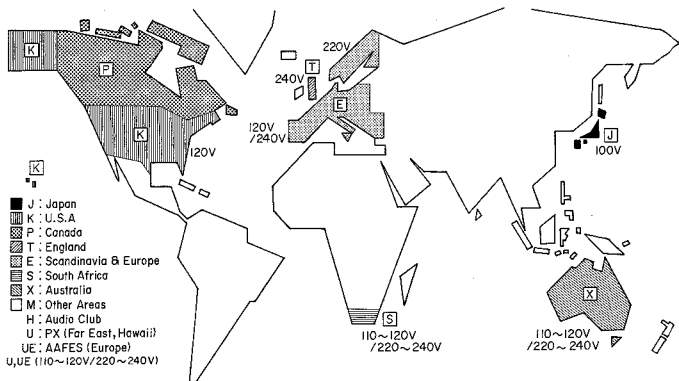
## PARTS LIST

| Ref. No. | Parts No.   | Description        | Remarks | Ref. No. | Parts No.   | Description           | Remarks |
|----------|-------------|--------------------|---------|----------|-------------|-----------------------|---------|
| 参照番号     | 部品番号        | 部品名 / 規格           | 備考      | 参照番号     | 部品番号        | 部品名 / 規格              | 備考      |
| C96      | C25-1733-57 | LL-ELEC 3.3UF 50W  |         | * 100    | F13-0615-05 | PHONO KALAM (6P)      |         |
| C97      | C25-1210-77 | LL-ELEC 100UF 16W  |         |          | E04-0005-05 | RECEPTACLE            |         |
| C99      | C52-1711-57 | CELE-EP 100P       |         |          |             |                       |         |
| C102     | C46-1739-25 | MYLAR 0.0039UF J   |         | CF1-4    | L79-0130-05 | CERAMIC FILTER KIT FM | X       |
| C103,104 | C46-1722-35 | MYLAR 0.0022UF J   |         | CF1-4    | L79-0131-05 | CERAMIC FILTER KIT FM | X       |
| C105     | C25-1710-57 | LL-ELEC 1UF 50W    |         | CF1-4    | L79-0132-05 | CERAMIC FILTER KIT FM | X       |
| C107     | C52-1711-57 | CELE-EP 100P       |         | CF1-4    | L79-0133-05 | CERAMIC FILTER KIT FM | X       |
| C109     | C46-1710-25 | MYLAR 0.001UF J    |         | CF1-7    | L79-0138-05 | CERAMIC FILTER KIT FM | X       |
| C110     | C52-1710-26 | CERAMIC 0.001UF J  |         | L2       | L40-2292-11 | INDUCTOR 2.2UH        |         |
| C113,114 | C46-1711-57 | LL-ELEC 3.3UF 50W  |         | L6       | L30-0315-05 | IFT                   | FM      |
| C115     | C46-1715-25 | MYLAR 0.0015UF J   |         | L6       | L30-0316-05 | IFT                   | FM      |
| C117     | C46-1710-35 | MYLAR 0.01UF J     |         | L6       | L30-0317-05 | OSCILLATING COIL FM   |         |
| C119     | C26-1101-67 | NP-ELEC 100UF 10W  |         | L6       | L32-0322-05 | IFT                   | FM      |
| C120     | C25-1710-57 | LL-ELEC 3.3UF 50W  |         | L7       | L32-0323-05 | OSCILLATING COIL FM   |         |
| C141     | C91-0083-05 | CERAMIC 0.01UF N   |         | L8       | L32-0324-05 | OSCILLATING COIL LW   |         |
| C142     | C25-1210-77 | LL-ELEC 100UF 16W  |         | L7       | L79-0122-05 | FILTER (BPF)          |         |
| C143     | C25-1210-67 | LL-ELEC 100UF 16W  |         | L9       | L79-0123-05 | FILTER (BPF)          |         |
| C145     | C25-1211-77 | LL-ELEC 100UF 16W  |         | L10      | L79-0125-05 | FILTER (BPF)          |         |
| C146     | C47-74-25   | POLYSTY 4700PF J   |         | L11      | L31-0463-05 | RF COIL               | AM      |
| C147     | C25-1210-77 | LL-ELEC 100UF 16W  |         | L12      | L32-0254-05 | OSCILLATING COIL      | AM      |
| C148     | C46-1710-25 | MYLAR 0.001UF J    |         | L13      | L31-0515-05 | COIL                  | AM      |
| C149     | C25-1733-57 | MYLAR 0.001UF J    |         | L14      | L30-0337-05 | IFT                   | AM      |
| C150     | C46-1782-25 | MYLAR 0.0082UF J   |         | L15      | L40-2292-11 | INDUCTOR 2.2UH        |         |
| C151     | C25-1733-57 | MYLAR 0.0033UF 50W |         | L15      | L31-0515-05 | MOX COIL              | AM      |
| C152     | C25-1722-57 | LL-ELEC 2.2UF 50W  |         | L18      | L40-2292-11 | INDUCTOR 2.2UH        |         |
| C153     | C46-1722-25 | MYLAR 0.0022UF J   |         | L18      | L40-4721-28 | INDUCTOR 4.7UH        |         |
| C154     | C91-0083-05 | CERAMIC 0.01UF N   |         | N61      | R49-6239-23 | RW 3.9K               | F ZE    |
| C155     | C91-0083-05 | CERAMIC 0.01UF N   |         | R67,68   | R43-1233-05 | FL-PROOF R033         | J ZE    |
| C156     | C91-0083-05 | CERAMIC 0.01UF N   |         | R125     | R43-1233-05 | FL-PROOF R04-7        | J ZE    |
| C15A-15H | C91-0083-05 | CERAMIC 0.01UF N   |         | R156,157 | R43-1233-15 | FL-PROOF R030         | J ZE    |
| C159     | C25-1733-57 | MYLAR 0.0033UF 50W |         | R182     | R43-1222-05 | FL-PROOF R022         | J ZE    |
| C160     | C46-1727-15 | POLYSTY 270PF J    |         | R183     | R43-1215-15 | FL-PROOF R010         | J ZE    |
| C161,162 | C46-1727-15 | POLYSTY 270PF J    |         | R220,221 | R43-1215-15 | FL-PROOF R04-7        | J ZE    |
| C163     | C25-1210-77 | LL-ELEC 100UF 16W  |         | R260,261 | R43-1210-15 | FL-PROOF R010         | J ZE    |
| C164,165 | C26-1210-77 | NP-ELEC 100UF 16W  |         | X201     | R40-0315-08 | RETRIMING POT. 1.8M   | W H     |
| C166,167 | C46-1710-25 | MYLAR 0.001UF J    |         | VR1      | R55-0015-05 | TRIMMING POT.         | S0      |
| C170,171 | C91-0185-05 | POLYSTY 100PF G    |         | VR2      | R12-3302-05 | TRIMMING POT.         | 5K      |
| C172,173 | C91-0184-05 | POLYSTY 47PF G     |         | VR3      | R12-3303-05 | TRIMMING POT.         | 10K     |
| C174,175 | C91-0185-05 | POLYSTY 100PF G    |         | VR4      | R12-3303-05 | TRIMMING POT.         | 2K      |
| C176,177 | C91-0185-05 | POLYSTY 100PF G    |         | VR5      | R12-3303-05 | TRIMMING POT.         | 2K      |
| C178,179 | C46-1718-25 | MYLAR 0.0018UF J   |         | VR8-10   | R12-1303-05 | TRIMMING POT.         | 2K      |
| C180,181 | C46-1736-35 | MYLAR 0.0036UF J   |         | VR11     | R12-2302-05 | TRIMMING POT.         | 5K      |
| C182,183 | C47-1756-15 | POLYSTY 560PF J    |         | VR12     | R12-3060-05 | TRIMMING POT.         | 20K     |
| C184,185 | C46-1718-35 | MYLAR 0.0175-35    |         | VR13     | R12-3060-05 | TRIMMING POT.         | 20K     |
| C186,187 | C46-1726-35 | MYLAR 0.0026UF J   |         | VR14     | R06-2012-05 | POTENTIOMETER         |         |

## PARTS LIST

| Ref. No.<br>参照番号              | Parts No.<br>部品番号 | Description<br>部品名 / 規格 | Re-<br>marks<br>備考 |
|-------------------------------|-------------------|-------------------------|--------------------|
| IC6                           | V30-0519-10       | LA1245                  |                    |
| IC7                           | V30-0273-20       | UPC4557C                |                    |
| IC8                           | V30-0509-10       | TR4011                  |                    |
| IC9                           | V30-0516-10       | MB84066B                |                    |
| IC10                          | V30-0273-20       | UPC4557C                |                    |
| IC11, 12                      | V30-0266-20       | HA11223W                |                    |
| IC13                          | V30-0516-10       | MB84066B                |                    |
| IC14                          | V30-0530-10       | MB84071B                |                    |
| IC15-16                       | V30-0528-10       | MB84002B                |                    |
| IC17                          | V30-0529-10       | MB84013B                |                    |
| IC18-23                       | V30-0273-20       | UPC4557C                |                    |
| IC24                          | V30-0516-10       | MB84066B                |                    |
| Q1                            | V09-0136-10       | 2SK125                  |                    |
| Q2                            | V03-0504-05       | 2SC828A                 |                    |
| Q3                            | V01-0733-90       | 2SA733(A)               |                    |
| Q4                            | V03-0504-05       | 2SC828A                 |                    |
| Q5 ,6                         | V09-0127-40       | 2SK105(H,J)             |                    |
| Q7                            | V09-0124-20       | 2SK61(V)                |                    |
| Q8 -11                        | V03-0504-05       | 2SC828A                 |                    |
| Q13                           | V03-0504-05       | 2SC828A                 |                    |
| Q14                           | V03-0452-05       | 2SC1735                 |                    |
| Q15                           | V01-0733-90       | 2SA733(A)               |                    |
| Q16                           | V01-0173-05       | 2SA850                  |                    |
| Q17 -20                       | V03-0504-05       | 2SC828A                 |                    |
| Q21                           | V01-0733-90       | 2SA733(A)               |                    |
| Q22                           | V03-0452-05       | 2SC1735                 |                    |
| Q23                           | V03-0504-05       | 2SC828A                 |                    |
| Q24                           | V09-0127-40       | 2SK105(H,J)             |                    |
| Q25 -29                       | V03-0504-05       | 2SC828A                 |                    |
| Q31                           | V01-0733-90       | 2SA733(A)               |                    |
| Q31                           | V01-0733-90       | 2SA733(A)               |                    |
| Q32 -35                       | V03-0504-05       | 2SC828A                 |                    |
| Q36                           | V01-0733-90       | 2SA733(A)               |                    |
| Q37                           | V04-0330-00       | 2SD330                  |                    |
| Q38                           | V02-0514-20       | 2SD514(E,F)             |                    |
| Q39 ,40                       | V03-0504-05       | 2SC828A                 |                    |
| Q41                           | V03-0452-05       | 2SC1735                 |                    |
| Q42                           | V03-0504-05       | 2SC828A                 |                    |
| Q44                           | V01-0733-90       | 2SA733(A)               |                    |
| TR1                           | V22-0006-05       | SDT-65                  |                    |
| =                             | W02-0056-05       | FM FRONT END            | *                  |
| <b>SWITCH (X13-2960-00)</b>   |                   |                         |                    |
| D1 -3                         | B30-0264-05       | LAMP(LED)               | *                  |
| D4 ,5                         | V11-0076-05       | 1K1555                  |                    |
| IC1                           | V30-0273-20       | UPC4557C                |                    |
| C1                            | C24-1710-57       | ELECTRO 1UF 50V         |                    |
| C2                            | C24-1022-71       | ELECTRO 220UF 10V       |                    |
| C3                            | C24-1710-57       | ELECTRO 1UF 50V         |                    |
| VR1                           | R12-1303-05       | TRIMMING POT. 2K        |                    |
| VR2                           | R12-2302-05       | TRIMMING POT. 5K        |                    |
| S1 -5                         | S42-5022-05       | PUSH SWITCH             | *                  |
| <b>FRONTEND (W02-0056-00)</b> |                   |                         |                    |
| D1                            | V11-2200-30       | 1S2267                  |                    |
| D2 -4                         | V11-7702-00       | 1S6R5                   |                    |
| Q1 ,2                         | V09-1002-56       | 3SK74                   |                    |
| Q3                            | V03-0461-20       | 2SC461                  |                    |
| Q4                            | V09-0124-20       | 2SK61                   |                    |

## WORLD MAP &amp; AREA CODE



## Note:

Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on, the U.S. (K) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

A product of

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